



LightWELDTM

Handheld & Automated Laser Welding &
Cleaning Systems

 **MORGAN
RUSHWORTH**
SINCE 1872

POWERED BY

 **IPG**
PHOTONICS

LightWELD Handheld Laser Welding Technology

LightWELD™ hand-held laser welding and cleaning systems are fast, easy to learn and operate, and produce high quality, consistent results across a wide range of materials and thickness's. Pre-weld and post-weld laser cleaning functionality optimises weld quality while increasing productivity.

LightWELD XR delivers a higher-brightness beam for welding an extended range of materials and thickness's up to 0.250" (6.35 mm), including reflective materials. Welding and cleaning materials such as titanium and copper are easy with LightWELD XR.

LightWELD XC provides a cost effective solution for laser welding of steel, stainless steel and aluminium with the additional functionality of pre- and post-weld cleaning. The XC can also be paired up with a wire feeding system for infill welding too.

	LightWeld 2000 XR	LightWeld 1500 XR	LightWeld 1500 XC	LightWeld 1000
	Extended Range Welding & Cleaning	Extended Range Welding & Cleaning	Welding & Cleaning	Welding Only
Welding Capability: Mild / Stainless Steel	Stainless Steel, Mild Steel, Galvanized Steel 8.25mm (0.315")	Stainless Steel, Mild Steel, Galvanized Steel 6.35mm (0.250")	Stainless Steel, Mild Steel, Galvanized Steel 4mm (0.160")	Stainless Steel, Mild Steel, Galvanized Steel 4mm (0.160")
Welding Capability: Aluminium 3 & 5 Series	Aluminium (3XXX, 5XXX, series) 8.25mm (0.315")	Aluminium (3XXX, 5XXX, series) 6.35mm (0.250")	Aluminium (3XXX, 5XXX series) 4mm (0.160")	Aluminium (3XXX, 5XXX series) 4mm (0.160")
Welding Capability: Aluminium 6 Series	5.0mm (0.200")	3.0mm (0.120")	---	---
Welding Capability: Titanium & Nickel Alloy	Titanium and Nickel Alloys 7 mm (0.275")	Titanium and Nickel Alloys 5 mm (0.200")	---	---
Welding Capability: Natural Copper	Copper 3mm (0.120")	Copper 2mm (0.080")	---	---
Wobble Welding	Up to 5mm width	Up to 5mm width	Up to 5mm width	Up to 5mm width
Cleaning Scan Width	Pre & Post-weld up to 15mm	Pre & Post-weld up to 15mm	Pre & Post-weld up to 15mm	-
High Frequency Peak Power for Cleaning	2500 W	2500 W	2500 W	-
Wire Welding Capability	Yes	Yes	Yes	Yes



LASER WELDING

High speed, low heat input, and a small HAZ make laser welding thick, thin, reflective materials, and materials with dissimilar thickness's far less challenging for all skill levels.



LASER PRE-CLEANING

Pre-weld cleaning removes rust and other contaminants from materials and increases weld quality. This is much faster than manual cleaning and uses no chemicals or abrasives.



LASER POST-CLEANING

Post-weld cleaning removes heat discolouration and improves visual finishes without post-weld grinding.



LightWELD Advantages & Benefits

LightWELD™ enables dramatically faster welding and is easier to learn and operate than MIG or TIG. LightWELD™ provides higher-quality, consistent results with minimal distortion or part deformation.

	Traditional Systems	LightWeld Systems
Speed	Average	Fast - Over 4x Faster than TIG
Quality	Depends on user's experience	Consistent, high-quality results
Learning Curve	Steep	Quick and easy
Part Set-Up	Critical and time-consuming	Minimal and fast
Material Flexibility	Limited with consumables changes	Wide range with no set-up
Heat affected zone	Large	Small
Distortion & Deformation	High	Very Low
Wobble Welding	No	Yes - up to 5mm
Pre-Weld Cleaning	No	Yes - Removes rust, oxides, oil & greases
Post-Weld Polishing	No	Yes - Removes soot, debris & discolouration



TIG welding can generate extreme heat that can deform thin materials, producing a poor visual finish. Welding copper is difficult, and welding metals of dissimilar thickness's is limited. TIG welding is a highly skilled process, and experienced TIG welders are harder to recruit, and an expensive resource.



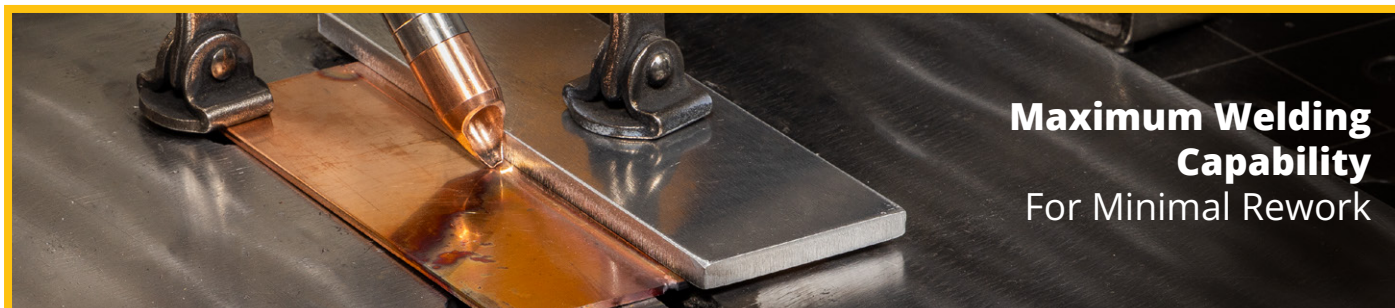
MIG welding requires a considerable amount of consumable wire (up to 8 inches per inch of travel), material pre-cleaning, and bevelled joints for full penetration of thick metals. Travel and working angles are limited, and vertical positions can be extremely challenging.

LightWELD systems are easier to learn and operate and are up to **4X faster** than TIG welding. The low heat input and extensive material and thickness capabilities increase productivity, repeatability, and improve weld quality for operators of all skill levels.



LightWELD Laser Welding & Cleaning Capability

LightWELD™ built-in optimised pre-sets provide high-quality, consistent welds for any skill level. LightWELD **XC** and LightWELD **XR** series offer the added functionality of pre- and post-weld cleaning. Pre-weld cleaning removes oil, grease, paint, or any potential contaminants that can affect weld quality. Post-weld cleaning creates visually appealing welds while eliminating need for post processing.



LightWELD **XR** models easily weld steel, stainless steel, aluminium, titanium, copper, and nickel alloys without part deformation. Pre-set modes ensure proper laser settings for consistent high-quality welds. Built-in wobble function accommodates wider seams, while wire welding capability extends welding application to poorly fit up parts.



LightWELD is powerful enough to melt metal and create a weld pool even if contaminants are present. However, to improve weld quality and reduce porosity, best results are attained by pre-cleaning to remove any oil, grease, or any debris that could enter the weld pool and create a defect.

Even the best welders can leave soot, debris, and visual signs of localised heating. A quick, final cleaning pass with LightWELD **XC** or LightWELD **XR** series leaves a beautiful, clean weld without the need for manual post-finishing.



Switching between welding and cleaning is fast and easy. Simply loosen the collet, insert the welding or cleaning nozzle, select a pre-set from the front panel, and the system is ready to clean or weld.

LightWELD Features & Operation

Laser welding power up to 2000 W is easily adjusted with intuitive controls to quickly dial in optimum weld settings for various materials and thickness's. With up to 74 stored pre-set and user-defined process parameters, novice welders can be trained and

Lightweight Hand-held Welding & Cleaning Gun

The hand-held welding & cleaning gun is compact, ergonomic, and comfortable. Specially designed nozzle tips for welding and cleaning applications, plus built in wobble functionality enable operators to produce high quality welds consistently. Nozzle tips switch out quickly and easily to accommodate fusion welding, wire welding, and cleaning, further optimizing and increasing productivity.

Simple Installation and Operation



1

240V Power



2

Standard Gas

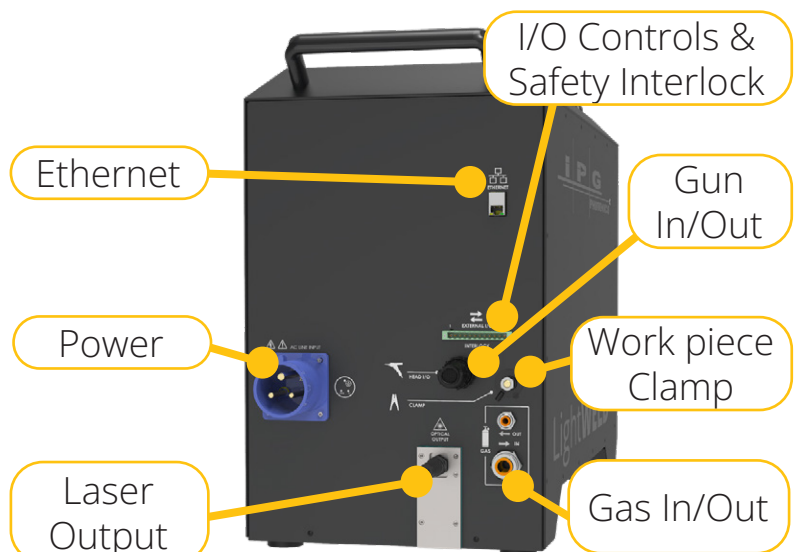


3

Work piece Clamp

Clearly labelled rear connections make getting started fast and easy. Just plug in the power cord and gas connection, attach the work piece clamp, and the system is ready to go. Laser power, gas and gun control is delivered through a single cable.

An Ethernet computer connection provides access to advanced settings to fine tune and save process parameters.





Optimised Factory Pre-sets and Laser Power Control

- Built-in parameters ensure high-quality results and can be customised for later use.
- Operators can instantly switch between pre-sets to accommodate many material thickness combinations.
- Simple controls allow new welders to be trained within hours and experienced welders realise an immediate increase in productivity.

Built-in Wobble Welding for Increased Productivity

- Create highly aesthetic seams and weld parts with poor fit up.
- Adjustable frequency and weld width up to 5 mm optimises results.
- Wobble parameters are pre-programmed and can be adjusted on the fly, saved, and recalled immediately.



Optional Wire Feeding Package

- Wire welding capability extends laser welding applications to poorly fit-up parts.
- Used for low carbon steel, stainless steel, aluminium, non-ferrous metals & alloys.





LightWELD Nozzles and Consumables

LightWELD systems are extremely economical in the consumables parts that they use. Each system is supplied with 4 different welding nozzles, and 3 different cleaning nozzles. The nozzles are quick and easy to swap and exchange, allowing for rapid changing between welding and cleaning.



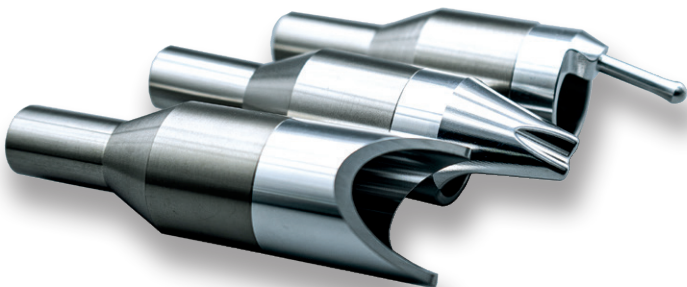
The 4 assorted welding nozzles supplied suit a variety of different applications.

- 1. 1-Point (General Purpose)
- 2. 2-Point (6mm)
- 3. 2-Point (9mm)
- 4. Circle

NOZZLE SELECTION					
	Butt Joint	Corner Joint	Tee Joint	Lap Joint	Edge Joint
 1-Point	✓	✓	✓	✓	✓
 2-Point (6mm)	✓	✗	✗	✓	✗
 2-Point (9mm)	✓	✗	✗	✓	✗
 Circle	✗	✗	✓	✗	✗

The 3 cleaning Nozzles allow you to work with a variety of angles and positions.

- 1. 2-Prong Nozzle
- 2. Outer Cleaning Nozzle
- 3. 1-Prong Cleaning Nozzle



The system is also supplied with a dual-extension tube, one of 58mm and another of 10mm, to suit various applications as required.

This is to allow for different laser beam focal lengths on varying materials and applications, such as outside corners.



"In my 41 years in the business, I have never seen a welder that allows beginners to make welds like seasoned pros!"



LightWELD Latest Models and Wire Feeding

The newly released Light**WELD 1000** makes laser welding even more economical to invest in. This welding only unit features all of the welding capacity of the XC model, in a more cost-efficient option.

Welding up to 4mm in mild, stainless and galvanised steel, as well as 3000 and 5000 series Aluminium.



IPG continues to push the capabilities of Laser Welding, with the new Light**WELD XR 2000**. Featuring a 2kW Fibre Laser Source, the XR 2000 is capable of up to 8.25mm in mild, stainless and galvanised steel, as well as 3000 and 5000 series Aluminium.

It is also perfectly suited to more reflective materials too, such as 1000 series Aluminium, and more exotic materials like Copper, Brass, Titanium and Nickel too.



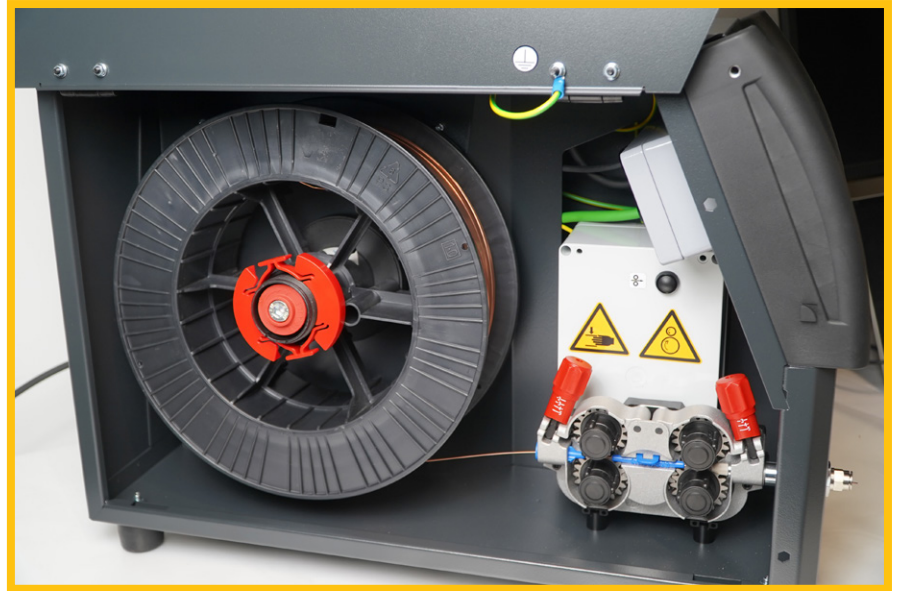
We now offer the IPG **WF-100** Wire Feeder, purpose built for laser welding, it offers a simple and intuitive interface where you can adjust the jog and feed rates accordingly, and choose between metric or imperial speed measuring for preference.

This simplified wire feeder is a simple plug-and-play solution for any IPG Light**WELD** system.



Quick Release

The streamlined wire feeder allows for quick and effortless switching between wire rolls, thanks to its tool-free wire holder design.



LCD Display

The clear display makes it easy to adjust your feed rates according to your material and preferences.



Dual Wire Feeder

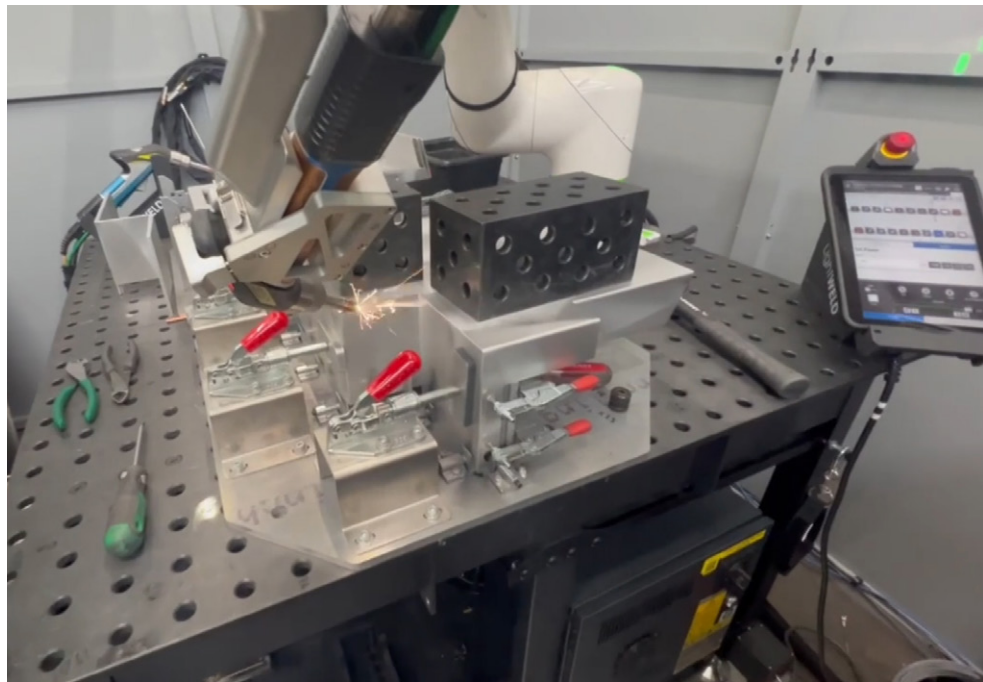
Looking to fill bigger gaps or add more strength? With this bracket any Light**WELD** can be used with dual wire feeders, allowing you to put down a much thicker weld when you need that extra support in the weld.



Light**WELD** Cobot Systems & Automation

Compatible with any Light**WELD** laser source, the Light**WELD** Cobot System is a collaborative robot laser welding system that makes automating a variety of welding jobs easy no matter your experience level.

The quick-release Cobot Connection Kit means you can still utilise your Laser Welder for manual hand held laser welding too.



With a payload of 10 kg and a reach of 1,249 mm, the Fanuc CRX-10iA Collaborative Robot is the perfect solution for medium- and small-sized businesses as well as automation beginners and large corporations. The CRX series offers a FANUC programming interface with simple drag and drop technology on a touchscreen pendant.

The ease of programming paired with FANUC's world-renowned technology, proven reliability, and sensitive contact detection allows the CRX-10iA to work safely alongside people in a variety of industrial and manufacturing applications. The CRX Series of cobots are 8 Years Zero Maintenance with the proven industrial reliability that FANUC customers expect.



Free Up Skilled Welders

Cobots should not be seen as a threat by experienced welders, they are perfect for taking on the repetitive, simple welds, freeing up the experienced welders to utilise their skills on trickier tasks.

FANUC Cobot Arms	CRX-10iA	CRX-10iA/L	CRX-20iA/L	CRX-30iA/L
Robot Payload (kg)	10	10	20	30
Max. Robot Reach (mm)	1249	1418	1418	1756
Axes	6	6	6	6
Mounting Positions				
Floor	Yes	Yes	Yes	Yes
Ceiling	Yes	Yes	Yes	Yes
Angle	Yes	Yes	Yes	Yes
Controller	R-30iB Plus Controller			
Repeatability (mm)	± 0.04	± 0.04	± 0.04	± 0.05
Mechanical Weight (kg)	40	40	41	135

Cobot Laser Welding simplifies the welding process even further, and is purpose-built to maximise your workshop's productivity by automating repetitive welds, optimising high-mix low-volume fabrication, and freeing up skilled welders for other projects.

Cobots can still carry out all aspects of Laser welding, including pre and post weld cleaning, and utilising wire-feeders for additional strength and support.



Laser Safe Modular Enclosures

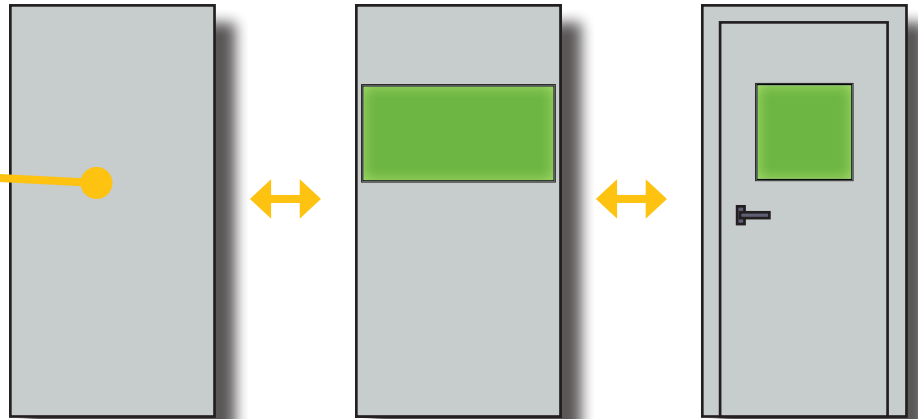
When it comes to Laser welding, safety is of the up-most importance. Given that laser welders utilise Class 4 laser diodes, all welding should be completed in a laser-proof workspace.

Morgan Rushworth Laser Safe Enclosures can be built to suit any space due to their modular design. Simply measure your intended space, and you can build your enclosure to suit from assorted panels, including safety interlocked doors, solid panels, or windowed panels featuring laser safety glass to allow light into the enclosures for operator comfort.

For added security and flexibility, the booth can also be configured with a 2 or 4 camera CCTV system for monitoring and safety purposes.

Modular Design

Choose from 3 panel types, solid wall, a door, or laser safety window panels to build your desired space.



Roof Panels

A roof is required if there is any space overlooking the booth, such as a second floor, or a mezzanine.

Laser Safety Glass

In the case of a reflected beam, the Laser Safety glass will absorb it keeping people outside of the booth safe.

Safety Interlock

To prevent unintended access, the door is fitted with a safety interlock, stopping the welder the moment the door opens. Protecting anyone who happens to open the door unexpectedly mid-weld.



Welding Tables

Equip your Laser Safe Enclosure with a Morgan Rushworth Welding Table.

Available in a range of sizes with tooling holes to suit your current equipment.



PPE and Extraction / Filtration

As well as the protective space, PPE is vital to protect the health and well being of operators. To this extent specialist welding helmets are required that also feature Laser protection as well as laser-safe goggles to be worn underneath. Laser's operate on a specific electromagnetic wavelength, and would cause permanent retina damage if they were to reflect back into your eyes.



As well as the standard laser welding helmets on offer, we also are proud to offer the **Optrel Panoramaxx Hybrid CLT**.

Purpose built for Laser welding, these light weight, comfortable helmets are the perfect compliment to an IPG Light**WELD**. With their Crystal Lens Technology it offers unrivalled clarity when welding.

They can also be paired with the **Swiss Air PAPR system** for TH3-Certified respiratory protection for your welders.



It is also vital to have adequate extraction and filtration in place to remove any fumes generated from the welding process as well. Options available from ourselves include Mobile Welding Extraction.

LightWELD™



Partnered with **Morgan Rushworth, IPG Photonics** is the world leader in fibre laser technology, with revolutionary laser solutions that enable greater **PRECISION**, higher **PRODUCTIVITY** and more **FLEXIBLE PRODUCTION** for applications across any industry.



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